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Blood lipid biomarkers after consumption of a commercial reduced milk fat cheese naturally-enriched in CLA

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Introduction: There is much interest in adding value to dairy products by naturally increasing the levels of poli-unsaturated fatty acids (PUFA). In this study, a commercial reduced milk fat cheese was made by using a mixture of CLA enriched milk (cows, ewes and goats) obtained by supplementation of ruminant diet with linseed. In addition to reduced saturated fat content, this functional cheese showed an enhanced amount in CLA and trans-11 C18:1 (CLA precursor in the mammary gland) and alpha-linolenic acid.

Objectives: Determination of the effects of the functional cheese (naturally CLA-enriched) consumption on plasma and erythrocytes lipids and investigate whether a reliable health biomarker can be identified.

Method/Design: Two groups (Light Cheese (LC) vs Light Functional Cheese (LFC) of healthy Wistar male rats (n=8 per group) were used in a dietary intervention trial. After 8-wk period, blood samples (plasma and erythrocyte) were collected for lipid analysis. Lipids were extracted by Folch method. Direct transesterification method described by Lepage was also used to obtain FAME. Lipid profile was thoroughly monitored by GLC-FID and triacylglycerols, polar lipids and FAME were analysed. For statistical analyses SPSS 19.0 software was employed.

Results: In the plasma samples, lipid distribution in polar (65%) and neutral lipids (35%) remained stable in the two diets tested, but a decrease in the polar compounds content from 50% in control diet to 40% in functional diet was detected in erythrocytes. Regarding FAME, LCF intake increased the linolenic acid and CLA contents in plasma, meanwhile a significant correlation between diet and the stearic, oleic, linolenic acids, total CLA and rumenic acid concentrations was found in erythrocytes.

Conclusions: The intake of LFC naturally enriched in healthy PUFA increase the presence of these fatty acids, used as biomarkers, in plasma and erythrocytes.

Key Words: CLA (conjugated linoleic acid), cheese, erythrocyte, PUFA